R E P O R T R E S U M E S

ED 015 009 PS 000 211

THE EFFECTS OF MONTESSORI EDUCATIONAL TECHNIQUES ON CULTURALLY DISADVANTAGED HEAD START CHILDREN.

BY- JOHNSON, HENRY SIOUX
CLAVIS MONTESSORI SCHOOLS, FULLERTON, CALIF.

REPORT NUMBER OEO-631 PUB DATE SEP 65
EDRS PRICE MF-$0.50 HC-$3.16 77P.

DESCRIPTORS- *PRESCHOOL EDUCATION, *PRESCHOOL EVALUATION, *TEACHING TECHNIQUES, *DEVELOPMENTAL PROGRAMS, EMOTIONAL DEVELOPMENT, PERCEPTUAL MOTOR LEARNING, SOCIAL DEVELOPMENT, INTELLECTUAL DEVELOPMENT, LANGUAGE FLUENCY, MEXICAN AMERICANS, ANGLO AMERICANS, CULTURALLY DISADVANTAGED, HEALTH NEEDS, PRETESTING, POST TESTING, *CULTURAL FACTORS, MONTESSORI, HEAD START, PPVT, DAP, WIDE RANGE, GESELL, MATEER,

TO DETERMINE WHETHER SIGNIFICANT DIFFERENCES EXIST IN SKILL PERFORMANCE AS A RESULT OF HEAD START EXPERIENCE AND TO DETERMINE WHETHER THESE DIFFERENCES EXIST BETWEEN TWO ETHNIC GROUPS, 17 ANGLO-AMERICAN AND 62 MEXICAN-AMERICAN CULTURALLY DISADVANTAGED CHILDREN WERE PRE-TESTED AND POST-TESTED DURING THE SUMMER OF 1965 IN CONNECTION WITH SIX-WEEK HEAD START PROGRAMS IN COSTA MESA AND FULLERTON, CALIFORNIA. FIVE TEACHERS USING MODIFIED MONTESSORI MATERIALS STRESSED THREE DEVELOPMENTAL AREAS, (1) PERCEPTUAL-MOTOR, (2) SOCIAL-EMOTIONAL, AND (3) INTELLECTUAL-ACADEMIC. SEVEN INSTRUMENTS WERE USED TO TEST THE PROGRAM'S EFFECTIVENESS--GESELL MATURATION INDEX, MATEER INVERSION TEST, TESTS OF DOMINANCE, TEACHER RATING SCALE, GOODENOUGH-HARRIS D-A-P, PEABODY PICTURE VOCABULARY TEST, AND WIDE RANGE ACHIEVEMENT TEST. RESULTS SHOWED THAT CERTAIN HANDICAPS DO EXIST AMONG CULTURALLY DISADVANTAGED CHILDREN PRIOR TO SCHOOL EXPERIENCE AND THAT POSITIVE GAINS OCCURRED WHEN ENRICHMENT EXPERIENCES WERE PROVIDED. GREATEST GAINS WERE IN THE AREAS OF INTELLECTUAL-ACADEMIC AND SOCIAL-EMOTIONAL SKILLS. ETHNIC DIFFERENCES APPEARED IN THE LINGUISTIC SKILLS LIMITATIONS OF THE MEXICAN-AMERICAN CHILDREN. NEED FOR MEDICAL AND DENTAL ATTENTION WAS APPARENT IN BOTH GROUPS. FUTURE PROVISION SHOULD BE MADE FOR CONTINUED PRESCHOOL EDUCATION AND WIDER DISSEMINATION OF HEALTH SERVICES. (LG)

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

ED015009

CLAVIS MONTESSORI SCHOOLS

SPECIAL EVALUATION HEAD START RESEARCH PROJECT

JAMES J. SLAVEN
DIRECTOR

The Effects of Montessori Educational Techniques on Culturally Disadvantaged Head Start Children

by

Henry Sioux Johnson, Ph.D.
Guidance Consultant
September, 1965

RESEARCH CONSULTANTS

John Motzkus, M.A.
Connie Lefeber, M.A.
Jean Davis, M.A.
Uvaldo Palomares, M.A.
Arthur Rosenthal, Ph.D.
Elnora Schmadel, Ed.D.

The Research Reported Herein Was Supported Through the Office of Research and Evaluation, Project Head Start, Office of Economic Opportunity

PROJECT HEAD START CONTRACT NO. -OEO-631

AL 000 121

2473

ACKNOWLEDGEMENTS

The financial support of the Office of Economic Opportunity, Project Head Start Research and Evaluation is greatly acknowledged. Space permits me to extend appreciation to only a few of the many people who made this project possible.

The opportunity to work with the Montessori teachers and pupils was made possible only through the efforts of the Fullerton Branch of the League of United Latin American Citizens in cooperation with Mr. James J. Slaven, Chief Administrator of the Clavis Montessori Schools.

Mrs. Vera Smead was an ideal principal-teacher collaborator. Many of the pre and post testing procedures would not have been possible without her tolerance, patience and helpfulness.

Finally, I would like to extend particular appreciation to Mrs. Margaret Slaven, John Casas, Tom Newman, Mrs. McNamara, Miss Barbara Lamb, members of the Clavis Montessori Mothers Club and Mr. Ray Villa, President of the Orange County LULAC organization.

2474

TABLE OF CONTENTS

ACKNOWLEDGEMENTS 1

LIST OF TABLES ii

CHAPTER

I. Introduction 1

Statement of the Problem 4

Major Hypothesis 4

Project Design 6

Geographical Setting 6

The Sample 6

Descriptions of Instruments Used 12

Gesell Maturation Index 13

Mateer Inversion Test 13

Tests of Dominance 13

Teacher Rating Scale 14

Goodenough-Harris Draw-A-Person 15

Peabody Picture Vocabulary Test 15

Wide Range Achievement Test 16

Administration and Scoring Procedures 17

Statistical Procedures 17

II. Results of the Study 19

Comparison of Pre and Post Test Results Regardless of Ethnic Group Membership 19

2475

Table of Contents (Continued)

CHAPTER

II. Additional Objective Test Results 22

Ethnic Group Differences between the Pre and Post Test Evaluations 24

III. Summary and Conclusion 56

Summary 58

Conclusion 63

APPENDICES

Appendix A .....

Appendix B .....

2476

LIST OF TABLES

Table		Page
1.	Sample Breakdown by Sex and Ethnic Grouping	5
2.	Ethnic Group Differences by Average Annual Income	9
3.	Descriptive Characteristics of the Population Sample on Certain Miscellaneous Factors Regardless of Ethnic Group Membership	10
4.	Health Status of the Population Sample Regardless of Ethnic Group Membership	11
5.	Comparison of Pre and Post Test Results on each of the Four Objective Tests Used in the Study	20
6.	Comparison of Certain Perceptual-Motor Development Pre and Post Test Results Regardless of Ethnic Group Membership	23
7.	Comparison of Pre and Post Teacher Rating Scale Results on Each of the Three Developmental Levels Studied	25
8.	Sample Breakdown of Chronological Age in Terms of Months by Sex and Ethnic Grouping	27
9.	Ethnic Group Differences on Certain Health Factors as Reported by Project Head Start.Physicians.....	28
10.	Sample Breakdown of Height Measurements in Terms of Inches by Sex and Ethnic Grouping	29
11.	Sample Breakdown of Weight Measurements in Terms of Pound Units by Sex and Ethnic Grouping.....	30
12.	Ethnic Group Differences on the Pre and Post Peabody (PPVT) Test Results.....	32
13.	Ethnic Group Differences on the Pre and Post Draw-A-Person Test Results	33
14.	Ethnic Group Differences on the Pre and Post Gesell Maturation Test Results.....	35

2477

Table		Page
15.	Ethnic Group Differences on the Pre and Post Mateer Inversion Test Results	36
16.	Ethnic Group Differences on the Pre and Post Wide Range Reading Test Results	38
17.	Ethnic Group Differences on the Pre and Post Wide Range Arithmetic Test Results	39
18.	Ethnic Group Differences on the Pre and Post Ratings for the Total Rating Scale	40
19.	Ethnic Group Differences on the Pre and Post Ratings for the Total Perceptual-Motor Development Score on the Rating Scale	41
20.	Ethnic Group Differences on the Pre and Post Ratings for the Total Intellectual-Academic Development Score on the Rating Scale	42
21.	Ethnic Group Differences on the Pre and Post Ratings for the Total Social-Emotional Development Score on the Rating Scale	43
22.	Ethnic Group Differences on the Pre and Post Ratings of Item 1 of the Rating Scale: "Attitude Toward School	46
23.	Ethhic Group Differences on the Pre and Post Ratings of Item 2 of the Rating Scale on the "adjustment to group situations	47
24.	Ethnic Group Differences on the Pre and Post Ratings of Item 3 of the Rating Scale "independence from mother	48
25.	Ethnic Group Differences on the Pre and Post Ratings of Item 4 of the Rating Scale "child's interest in the program	49
26.	Ethnic Group Differences on the Pre and Post Ratings of Item 5 of the Rating Scale "contribution to class activities	50

2478

Table

27. Ethnic Group Differences on the Pre and Post Ratings of Item 6 of the Rating Scale "Vocabulary Development 51

28. Ethnic Group Differences on the Pre and Post Ratings of Item 7 of the Rating Scale "Interest Development in Language" 52

29. Ethnic Group Differences on the Pre and Post Ratings of Item 8 of the Rating Scale "Body Image and Body Differentiation" 53

30. Ethnic Group Differences on the Pre and Post Ratings of Item 9 of the Rating Scale "Laterality and Directionality Ability" 54

31. Ethnic Group Differences on the Pre and Post Ratings of Item 10 of the Rating Scale "Sensory Discrimination Ability" 55

2479

CHAPTER I

INTRODUCTION

Whenever the prevention or amelioration of the problems confronting culturally disadvantaged children are considered, the issues regarding their intellectual, academic and social abilities often arise. To date, the literature in this area has demonstrated the fact that culturally disadvantaged childred as a group tend to score significantly lower than middle class children on instruments designed as measures of intellectual or academic ability.

The problems involving the measurement of the intellectual and academic abilities of culturally disadvantaged children become even more pronounced when in addition to social class differences there is also the possibility of cultural-linquistic differences as in the case of culturally disadvantaged Mexican-American children.

Literature with respect to the intellectual and academic abilities of disadvantaged Mexican-American children during their first few years of development is non-existent. In general, available results concerning the intellectual and academic abilities of culturally disadvantaged Mexican-American children from kindergarten through grade twelve are very similar to those reported for culturally disadvantaged children.

Academically, Mexican-American children, at the kindergarten level,

-2480

have been observed to be between four and six months below Anglo-American children and progressively fall further behind until by the time they graduate from high school they achieve between one and a half to two years behind their classmates (Gray, 1962; Johnson, 1964)

Studies aimed specifically at an estimate of the Mexican American's intellectual ability have had a long history of measuring him at an average of 10 to 20 IQ points below the Anglo-American group (Keston, 1954). The findings over the past ten years with more culture "fair"tests have tended to demonstrate the fact that the 10 to 20 IQ point lack was due more to a function of the English, verbal, middle-class oriented intelligence tests formerly used, rather than low basic intellectual ability in the Mexican-American child.(Cook, 1955).

Recent studies, which are conducted with the emphasis on non-language, learning task-type intelligence tests, have shown similar intellectual abilities for learning for the Mexican-American and the Anglo-American (Jensen, 1961; Kidd, 1962).

To this investigator's knowledge, published research studies on the use of the Draw-A-Person, Peabody (PPVT) and other perceptual-motor tests with culturally disadvantaged preschool children are very sparse.

A recent article by Naumann (1965) is one of the first published attempts in such research endeavors. Naumann employed the PPVT as well as other individual intelligence and academic tests to evaluate the effectiveness of a modified Montessori approach to education. He used a sample

2481

of thirty children ranging in ages 2 1/2 to 7 years. Tentative results showed some changes in the children's behavior after a seven week period. The final results are to be reported at the end of the year study.

Skeels' (1965) longitudinal study of adoptive disadvantaged children is perhaps the most encouraging and enlightening report to be found in the literature. Preliminary indications show that these impoverished children have continued to function at a higher intellectual, educational and socioeconomic levels than their biological parents. The author points out the fact that environmental factors are indeed conducive factors that must be considered in any rehabilitation program for counteracting the devastating effects of poverty or socio-cultural deprivation.

In summarizing the literature with respect to previous factor studies at the infant and childhood levels, Orpet (1964) concluded that the lack of experimental effort at these developmental levels are traceable to the unavailability of suitable test materials for use with preliterate children and the necessity for costly and time consuming individual or small group testing conditions.

In effect, a systematic investigation of the intellectual, academic and social abilities of preschool culturally disadvantaged youngsters is presently lacking. A definite need for a carefully conceived and carefully executed study must therefore be a prerequisite toward a better understanding of culturally disadvantaged children in general and Mexican-American preliterate youngsters in particular.

2482

STATEMENT OF THE PROBLEM

It was the purpose of this study: (1) to determine whether or not significant differences in performance on each of the designated skill areas as measured exist between the pre and post testing periods for each of the culturally disadvantaged preschool children regardless of ethnic group membership; and (2) to determine whether or not these significant differences exist betweentthe Anglo-American and Mexican-American preschool Head Start culturally disadvantaged children.

The culturally disadvantaged children were taught by five Montessori teachers using materials invented by Dr. Maria Montessori. Montessori's educational philosophy is based on the assumption that all children have a desire for manipulative learning of educational tasks at an early age, if they are given the necessary opportunities and guidance.

It is hypothesized in this study that the Montessori experiences could provide the significant impetus which would eventually alleviate the present educational handicaps of these preschool culturally disadvantaged children.

MAJOR HYPOTHESIS

The study attempted to evaluate the children's performances in three developmental areas: perceptual-motor, social-emotional and intellectual-academic. The major hypothesis used to guide this study is based on

2483

TABLE I

SAMPLE BREAKDOWN BY SEX & ETHNIC GROUPING

SEX	ANGLO-AMERICAN	MEXICAN-AMERICAN	TOTAL
BOYS	35% (6)	47% (29)	44% (35)
GIRLS	65% (11)	53% (33)	56% (44)
TOTAL	100% (17)	100% (62)	100% (79)

2484

the null hypothesis concept. The null hypothesis suggests the notion that there will be no significant differences in performance on each of the three developmental areas as measured between the first and last weeks of testing and between the two ethnic groups studied.

PROJECT DESIGN

Geographical setting. Two Clavis Montessori Centers were utilized in the study. The first Center, containing four Montessori teachers and their teacher aides, who were recruited from the target areas in the community, was located in Fullerton, California. Culturally disadvantaged children who resided in the cities of Fullerton (N=31) and its neighboring city of Placentia (N=35) were accepted as candidates for the preschool Head Start Program. The second Center was located in Costa Mesa, California. It was staffed by one Montessori trained teacher and two teacher aides. Eligible preschool children from the cities of Costa Mesa and its neighboring municipality of Santa Ana (N=13) were recruited for the program.

The sample. The research design was scheduled to include 100 preschool culturally disadvantaged youngsters. Table 1 gives the actual number of children that were ultimately included as subjects for the study. Since the pre-testing began during the first week, only 89 pre-schoolers were tested. The sixth or last week of testing necessitated

485

the elimination of five students. These pupils dropped out for a number of reasons; such as, illness, unexcused absences and the beginning of parochial fall attendance at another school. The total sample of 79 students as seen in Table 1 represents the same individuals who took the same battery of tests twice i.e., first and last week of schooling. The drop out rate of about six percent is certainly indicative of the adequate holding power of the Montessori Head Start program. In addition to the exclusion of the above five drop outs, five Negro children were also excluded from the total sample.

Table 1 shows that one out of five pupils were of Mexican-American descent. There were significantly more girls in the Anglo-American, but not in the Mexican-American group.

Regardless of ethnic group membership the median annual income level shown in Table 2 falls within the $3000 to $3999 range as employed in the study. As expected, the obtained median income falls within the commonly accepted classification of poverty; especially when the size of the family is taken into consideration. The average Head Start family contains 3.9 children per household.

The average income for Orange County is approximately twice ($7000 to $7999) that obtained for the families in this study. In addition, the average Orange County family has about two children per family compared to almost four children in the Head Start enrollee's family.

2486

Further analysis of Table 2 reveals the fact that the median income of the Mexican-American group ($3,000 to $3,999) is significantly lower than that for Anglo-American group ($5,000 to $5,999) in this study. However, it should be noted that the annual income of the Mexican-American and Anglo-American families are significantly below the average Orange County annual income.

The average Head Start pupil is 62 months old (5 years and 2 months) as shown in Table 3. The obtained difference of 1.60 months between the boys and girls mean ages is not significant beyond the five percent level.

Table 3 also summarizes the height and weight measurements for the preschoolers in the program. The average height of 40 inches for both sexes falls outside the tenth percentile criterion as illustrated on the CAP-HS Form 30 entitled: Health Record for the Preschool Child. The average weight of 42 lbs., on the other hand, falls near the fiftieth percentile mark on the designated Health Record for an average child that is five years and two months old. Thus the results on Table 3 show that the average Head Start weight is normal for his chronological age, but his physical development in terms of height measurements is significantly below normal. A typically short, but slightly overweighted preschooler is depicted by the above findings.

No significant F ratios beyond the five percent level were obtained from the analysis of variance computations for the obtained differences between the boys and girls height and weight measurements.

TABLE 2

ETHNIC GROUP DIFFERENCES BY AVERAGE ANNUAL INCOME

INCOME LEVEL	ANGLO-AMERICAN N=17	MEXICAN-AMERICAN N=62	BOTH N=79
$1,000 to $1,999		1	1
$2,000 to $2,999	1	8	9
$3,000 to $3,999	3	26	29
$4,000 to $4,999	2	12	14
$5,000 to $5,999	2	4	6
$6,000 to $6,999	3	5	8
$7,000 to $7,999	2	4	6
$8,000 to $8,999	2		2
Above $9,000	2	1	3

TABLE 3

DESCRIPTIVE CHARACTERISTICS OF THE POPULATION SAMPLE ON CERTAIN MISCELLANEOUS FACTORS REGARDLESS OF ETHNIC GROUP MEMBERSHIP

MISCELLANEOUS FACTORS	BOTH SEXES MEAN	BOTH SEXES S.D.	BOYS MEAN	BOYS S.D.	GIRLS MEAN	GIRLS S.D.	MEAN DIFF.
Chronological Age in Months	61.71	8.58	62.60	9.69	61.00	7.63	1.60
Height In Inch Units	40.09	5.43	41.37	5.20	39.07	5.44	2.30
Weight in Lbs. Units	42.47	2.64	42.71	2.70	42.27	2.61	0.44

2489

TABLE 4

HEALTH STATUS OF THE POPULATION SAMPLE
REGARDLESS OF ETHNIC GROUP MEMBERSHIP

HEALTH CONDITION	MEDICAL	DENTAL	BOTH CONDITIONS
YES (denotes presence of health problem)	29% (23)	40% (32)	35% (55)
NO (satisfactory condition)	71% (56)	60% (47)	65% (103)
TOTAL	100% (79)	100% (79)	100% (158)

Table 4 gives the results of the medical and dental examinations by the team of Head Start physicians. The medical and dental check-ups consisted of a thorough routine physical examination including a tuberculin, urine and blood tests. Routine height, weight, vision and hearing tests were given as the need arose.

If the medical or dental examinations revealed a problem in any one of the areas described in the preceding paragraphs, a Yes response was recorded for purposes of this study. If the child's "physical" was satisfactory, a No response was indicated.

Table 4 reveals the fact that one out every three preschoolers has a medical problem that has been uncorrected or undetected.These problems ranged from cardio vascular defects to abnormal skin, eyes, ears, genitalia and lung conditions. The dental findings shows even larger numbers of children (40%) who had unfilled carious teeth, malocclusion or soft tissues. These health findings demonstrate the urgent need for medical and especially dental attention for large numbers of culturally disadvantaged preschool children.

DESCRIPTIONS OF INSTRUMENTS USED

Seven instruments were used to assess the three developmental skill areas: perceptual-motor, social-emotional and intellectual-academic. The following paragraphs in this section describe the specific devices utilized to evaluate each of the three designated skills. Copies of the tests are found in the Appendix.

2491

Perceptual-motor development

1. Gesell Maturation Index. This test was designed by Arnold L. Gesell and his co-workers during the late thirties (A.L. Gesell, Developmental Diagnosis Paul B. Hoeber, Inc.; 1947). The Gesell Index measures the visual, integrative and motor maturation functions which are translated into the acts of drawing. An age score denoting the maturational level is based on the satisfactory reproduction of each of the developmental tasks. The Index is primarily an individually administered diagnostic test. It is essentially untimed. The pupil uses a No. 2 pencil. More than one trial is permissible.

2. Mateer Inversion Test. The Mateer was designed by Dr. Florence Mateer, Professor Emeritus at the Claremont Graduate School in California in 1930. The Mateer test measures the child's readiness to begin to learn to read. The individually administered test was based on the principles that right and left discrimination ability is a function of physiological (neurological) organization and development. The subject is asked to copy each one of the drawings (rotated figure 5's) as quickly as possible. He is directed to copy them under each figure. Four or more errors denotes a lack of readiness for reading. The criterion was based by Dr. Mateer on impirical observations and standardized reading readiness tests.

3. Tests of Dominance. It is clear from the evidence in the literature that unilateral dominance (eye, hand and foot) is well stabilized to one or the other hemisphere of the brain by age two. Except for brief lapses up to

2492

the age of six the established dominance remains fixed. Authorities in the field suggested that ambidexterous children are often less intelligent and that the lack of development of hand-eye preference is usually part of a lack of general development of the brain functioning (i.e., speaking, reading, writing, and to a less extent, more intricate pedal skills).

The following dominance techniques employed in the study are simple in design, but they give fairly consistent results when repeated on different days:

(a) observation of preferred hand used for writing and eating; (b) observation of preferred foot used for kicking; (c) observation of preferred eye used when subject is requested to look at the examiner's finger or other object through a peep hole in an 8 1/2 x 11 sheet of paper.

Several trials were made each time for every subject in the project.

Social-emotional Development

1. Preschool Record...a teacher rating scale. A teacher rating scale was designed by the investigator and then submitted for try-out and criticism or wording to a number of individuals representing the viewpoints of teachers, psychologists and administrators. Suggestions for clarifying the wording of a few items were incorporated in the final form.

The rating scale was completed by the child's teacher during the first and sixth (last) week of the program. The information obtained was used for crossvalidating similar objective test data used in the study (i.e., language development, social-emotional adjustment and perceptual-motor

2493.

development). In order to reduce bias ratings to a minimum, a second rating sheet was filled out by the teacher during the last week of school.

2. Goodenough Draw-A-Person Test. The Draw-A-Person test is an individually administered device which was used to assess the pupil's social-emotional development. It was also used as a rapid and fairly accurate intelligence test that is standardized for children 4 to 10 years of age. The human figure which the child draws is to a considerable extent an index of this conception of himself. The child's body image concept varies according to his developmental level and is constantly modified by experience. In short, the figure drawn reflects the perceptual and personality problems, problems in the control of motility, compensatory efforts, and efforts at control of impulses with rigidity, fears, withdrawal or aggression. The pre and post drawings initiated in this study present an opportunity for evaluating the changes in the pupil's feelings as his condition betters or grows worse.

The test is scored by a point system. The child gets one point for each detail drawn, the head, the eyes, the arms, and so on. The total number of points for a given figure represents his social-emotional as well as intellectual development.

Intellectual-academic development.

Peabody Picture Vocabulary Test (PPVT). The PPVT Form A, 1959 edition by Lloyd Dunn was the instrument used to estimate the subject's verbal intelligence through measuring his hearing vocabulary. The test

2494

was standardized on pupils ranging in ages from 3-3 to 17-6.

Since the PPVT does not require the subject to read, it was deemed especially fair for non-readers (preschoolers) regardless of ethnic background. This individually administered test is untimed. The responses are non-oral (subject is required only to point out the correct picture in line with the orally presented stimulus word by the examiner). The examiners did not translate the stimulus word for non-English speaking pupils in the study.

The total number of pictures correctly identified represents the pupil's score. The total raw scores can be coverted to mental age or intelligence quotient values.

Wide Range Achievement Test. This achievement test for reading, arithmetic and spelling (not used in this study) was devised by Joseph Jastak. The 1946 edition was used for the prognosis of academic achievement in two skill areas; reading and arithmetic. This diagnostic test yields a grade placement score for the number of correct responses on both the reading and arithmetic tests.

The 15 items of the oral arithmetic supplement test to determine the development of number concepts at the preschool level was used . Especially when the subject was unable to solve any of the computation problems because his achievement level is below the second grade.

2495

ADMINISTRATION AND SCORING PROCEDURES

The tests or devices for measuring the three developmental areas: perceptual-motor, social-emotional and intellectual-academic were administered in the first week and again during the sixth (last) week of the Head Start program. The rating scale was completed by the child's teacher. The Gesell Maturation Index and the Mateer Inversion tests were administered by the teacher aides. The remaining four tests were given by a team of psychologists and psychometrists who were employed as consultants for the research project. Prior to the test administration each teacher and her assistant was given an intensive in-service program in testing and on the rationale of the rating scale. In all instances, testing was conducted under the direct supervision of the research staff at each Center.

The tests were hand-scored by the research staff. The raw scores for all the tests were key-punched on IBM cards.

STATISTICAL PROCEDURES

Means, standard deviations, analysis of variance, and F ratios were the statistical tools in this study. In calculating the sampling and descriptive statistics, the BIMD 05V and the BIMD 03R programs were employed on the 7040 and 7090 machines of the University of California, Los Angeles Health Sciences Computing Facility. The BIMD 05V program is essentially a 2 x 2 general linear factorial design for computing the differences between means by the analysis of variance technique. The BIMD

2496

03R program is used to obtain means, standard deviations and correlation coefficients.

In an effort to test the homogeneity of variance within each cell for the BIMD 05V output, Bartlett's test as described by Guilford (1956 was employed.

497

CHAPTER II

RESULTS OF THE STUDY

This chapter will be presented in two sections, in line with the stated purposes of the study. The first section will deal with the pre and post test results regardless of ethnic group membership. The second section will involve the comparisons between the Anglo-American and Mexican-American ethnic groups on each of the variables investigated in the study.

A. Comparison of Pre and Post Testing Results Regardless of the Ethnic Factor

Objective Test Results. Table 5 summarizes the results for the Peabody (PPVT), Draw-A-Person, Gesell Index and the Achievement Tests.

Three significant F ratios are found in Table 5. The average raw score units for the PPVT and Draw-A-Person can be transformed with the aid of their respective manuals into mental age and IQ units. Using the mean chronological age of 61.71, shown in Table 3, the following MA and IQ scores are obtained: On the Peabody, the pre-test mean mental age (MA) score was 3-5 and a mean IQ score of 72. On the post test, the mean MA score rose to 3-9 and the mean IQ to 79. The mean difference of 7 IQ points on the pre and post Peabody test is significant beyond the five per cent level. On the Draw-A-Person, the mean MA for the pre and post test were 4.9 and 5.9 respectively. The mean IQ's for the obtained

2498

TABLE 5

COMPARISON OF PRE AND POST TEST RESULTS
ON EACH OF THE FOUR OBJECTIVE TESTS
USED IN THE STUDY

OBJECTIVE TESTS	EVALUATION PERIOD					
	PRE-TESTING		POST-TESTING		MEAN	F
	MEAN	S.D.	MEAN	S.D.	DIFFERENCE	RATIOS
PEABODY (PPVT)	34.81	17.75	38.99	17.38	4.18	6.21**
DRAW-A-PERSON	7.15	3.76	10.76	5.28	3.61	30.27*
GESELL MATURATION INDEX	4.14	1.22	4.25	2.04	0.11	0.66
ACHIEVEMENT TEST READING	0.96	0.23	1.04	0.21	0.08	0.30
ARITHMETIC	4.29	0.47	5.71	0.46	1.42	5.10**

* Significant at the one per cent level
** Significant at the five per cent level

NOTE: All the above tests are reported in raw score units except the Gesell Index which is recorded in developmental age units.

2499

MA scores was 92 and 111. The mean difference of 19 IQ points is very significant beyond the one per cent level.

As expected, the culturally disadvantaged children were found to be functioning at the border line mentally retarded level on the Peabody test. This test is highly verbal in nature and the subjects degree of understanding the English vocabulary depends largely on his environmental experiences. The Draw-A-Person test results raised the preschooler's IQ from low normal to above average level in a matter of six weeks.

The results show that the subjects gain in MA units on the Peabody as two times the normal expected rate of one month growth in mental age for one month of chronological growth. On the Draw-A-Person four times, the normal growth mental age rate was obtained.

The remarkable growth on the intelligence tests also are seen on the Wide Range Arithmetic test as shown on Table 5. The raw score units, when transformed to grade placement units show an increase of 3 months for the six week instructional period. This means that the preschool children showed a definite improvement in their oral arithmetic readiness skills. On the reading test, two months growth was obtained, but the F ratio is not significant beyond the five per cent level. This means that the apparent increase may be due to chance factors inherent in the testing situation, the test, the examiner, or even the pupil.

The Gesell Index results also seen in Table 5 likewise displayed

2500

some increase in perceptual motor development. The obtained F ratio for the difference between the pre and post means is not significant however. Chance factors may still be operatable in this instance as that for the reading test discussed in the preceding paragraph.

q Additional Objective Test Results. As seen in Table 6, the Mateer Inversion results show conclusively the pupil in adequate reading readiness state. Although some noticeable gains between pre and post tests are seen, a majority of the subjects will need considerable exercise and assistance before formal reading can be initiated.

The Mateer findings above, are substantiated by the Wide Range Reading test results shown in Table 5. Both these tests and the Gesell Index show that the subjects in this study are not ready for formal reading experiences.

Analysis of the dominance test suggest that part of the lack of reading readiness may stem from an inadequate coordination of the eye-hand movement. Since the majority of normal children have established a dominance by the age of two years, almost one out of every two subjects in this study show some degree of retardation in the adequate development of laterality on directionary skills. In short, ambidexterity appears to be the rule rather than the exception. The pre and post test results show an increase in hand-eye preference, but the obtained F ratios are significant beyond the five per cent level.

501

TABLE 6

COMPARISON OF CERTAIN PERCEPTUAL-MOTOR DEVELOPMENT PRE AND POST TEST RESULTS REGARDLESS OF ETHNIC GROUP MEMBERSHIP

PERCEPTUAL MOTOR TESTS	EVALUATION PERIOD PRE-TEST	POST-TEST	DIFFERENCES
Mateer Inversion Test			
Adequate	8% (6)	11% (9)	3% (3)
Inadequate	92% (73)	89% (70)	3% (3)
Differences	84% (67)	78% (61)	
Dominance Tests			
Established	56% (44)	63% (50)	7% (6)
Not Established	44% (35)	37% (29)	7% (6)
Differences	12% (9)	26% (21)	

502

Teacher Rating Scale Results. Table 7 reports very significant changes in all three of the developmental skills areas measured in this study. All the F ratios without exception are significant beyond the one per cent level. A rank order analysis of the rating scale results show greatest improvement in the child's interest in the program followed next by contributions to class activities and vocabulary development. All three of these activities are related in some way to the child's over-all intellectual and academic growth. The significant IQ test results apparently agree well with the teachers observations of the children.

Further agreements are seen in those items on the rating scale which are ranked last. It can be seen that, without exception, they all fall within the perceptual-motor category. As was reported earlier, the Gesell, Mateer and dominance tests, without exceptions, revealed very slow growth in these same developmental areas.

In short, the cross validation of the teacher's ratings of pupils behavior with the results obtained on the objectives, further supports the validity that significant increase has in reality occured during the sixth week period. In some areas, the development has been phenominal, in others, the growth has been minimal.

B. ETHNIC GROUP DIFFERENCE BETWEEN THE PRE AND POST TEST EVALUATIONS

Preliminary Data. Table 8 gives the chronological ages for both ethnic groups by sex. The boys are a little older than girls, but the obtained F ratios for all the mean differences are not significant beyond

2503

TABLE 7

COMPARISON OF PRE AND POST TEACHER RATING SCALE RESULTS ON EACH OF THE THREE DEVELOPMENTAL LEVELS STUDIED (N=79)

DEVELOPMENTAL SKILLS	EVALUATION PERIOD PRE-TESTING MEAN	S.D.	POST-TESTING MEAN	S.D.	MEAN DIFF.	F RATIOS
Social-Emotional						
1. attitude toward school	2.89	0.75	3.54	0.90	0.64	29.05 *
2. adjustment to group situations	2.60	0.79	3.27	0.93	0.67	28.24 *
3. independence from mother	2.76	0.73	3.39	0.88	0.63	29.22 *
4. child's interest in program	2.55	0.81	3.11	0.96	1.22	29.10 *
SUB-TOTAL	10.75	2.55	13.58	2.92	2.83	54.30 *
Intellectual-Academic						
5. contribution to class activities	2.27	0.85	3.22	1.11	0.95	49.79 *
6. vocabulary development	2.09	0.93	3.02	0.98	0.93	54.27 *
7. interest development in language	2.14	0.92	3.03	0.93	0.89	47.51 *
SUB-TOTAL	6.51	2.47	9.86	2.47	3.35	76.80 *
Perceptual-Motor						
8. body image and differentiation of body parts	2.56	0.81	3.08	0.97	0.52	15.93 *
9. laterality & directionality; eye-hand coordination	2.57	0.79	3.10	0.96	0.63	17.59 *
10. sensory discrimination tactile, auditory, visual, kinesthetic	2.67	0.67	3.17	0.84	0.50	19.91 *
SUB-TOTAL	7.80	2.10	9.44	2.34	1.64	27.07 *
GRAND TOTAL FOR RATING SCALE	25.10	6.39	32.39	7.20	7.29	63.73 *

* Significant at the one per cent level

504

the five per cent level. In short, the Anglo-American and Mexican-American preschool pupils in this study are similar in chronological age.

As seen in Table 9, percentage-wise, both ethnic groups have similar numbers of youngsters who have medical problems. The Mexican-American children as a group appear to have larger numbers of dental problems than their ethnic counterpart.

The data in Table 9 illustrate the fact that more Mexican-American than Anglo-American have medical and dental problems. Since the Anglo group on the average come from a higher income level than their ethnic counterpart, the higher incidence of health problems may be related to the financial status of the family.

Table 10 and 11 presents the mean height and weight measurements for each ethnic group. Since none of the F ratios are significant beyond the five per cent level, one can surmise that Anglo-American and Mexican-American preschool children in this study are similar in nature.

Objective Test Results. The results of the Peabody (PPVT) in Table 12 show very conclusively that the Anglo-American child on the average has fewer handicaps in the verbal fluency area and in intelligence tests that are highly verbal than his Mexican-American counterpart. Table 12 indicates that the Anglo-American preschool child's mean MA is 5.1 and IQ 91 on the pretest. On the pretest the Mexican-American child's mean IQ is below 55, his MA is 3-2. For the post test, the Anglo child's mean MA increase 4 months to 4 for his ethnic counterpart. The Mexican-American

2505

TABLE 8

SAMPLE BREAKDOWN OF CHRONOLOGICAL AGE
IN TERMS OF MONTHS BY SEX AND ETHNIC GROUPING

SEX	ANGLO-AMERICAN MEAN	S.D.	MEXICAN-AMERICAN MEAN	S.D.	MEAN DIFFERENCE
BOYS	62.8.3	7.83	52.55	10.15	0.28
GIRLS	60.45	8.42	61.18	7.48	0.73
MEAN DIFFERENCES	2.38		1.37		

2506

TABLE 9

ETHNIC GROUP DIFFERENCES ON CERTAIN HEALTH FACTORS
AS REPORTED BY
HEAD START PHYSICIANS

HEALTH FACTOR	ANGLO-AMERICAN N=17	MEXICAN-AMERICAN N=62	TOTAL GROUP N=79
Medical			
YES	35% (6)	24% (17)	29% (23)
NO	65% (11)	76% (45)	71% (56)
BOTH	100% (17)	100% (62)	100% (79)
Dental			
YES	23% (4)	45% (28)	40% (32)
NO	77% (13)	55% (34)	60% (47)
BOTH	100% (17)	100% (62)	100% (79)

YES:= Indicates presence of a health problem

NO: Indicates satisfactory health

2507

TABLE 10

SAMPLE BREAKDOWN OF HEIGHT MEASUREMENTS
IN TERMS OF INCHES BY SEX AND ETHNIC GROUPING

SEX	ANGLO-AMERICAN MEAN	S.D.	MEXICAN-AMERICAN MEAN	S.D.	MEAN DIFFERENCE
BOYS	43.50	1.38	42.55	2.89	0.95
GIRLS	42.55	2.58	42.18	2.65	0.37
MEAN DIFF.	0.95		0.37		

2508

TABLE 11

SAMPLE BREAKDOWN OF WEIGHT MEASUREMENTS IN TERMS OF POUND UNITS BY SEX AND ETHNIC GROUPING

SEX	ANGLO-AMERICAN MEAN	S. D.	MEXICAN-AMERICAN MEAN	S. D.	MEAN DIFFERENCE
BOYS	41.67	3.67	41.31	5.52	0.36
GIRLS	40.09	5.54	38.73	5.45	0.09
MEAN DIFFERENCES	1.58		2.58		

2509

child showed numerically greater gains IQ-wise 8 to 4 points for his Anglo counterpart. The F ratios for the pre and post test mean increases or gains are all not significant beyond the five per cent level.

In passing, it should be noted that the Anglo-American child has a mean IQ that is slightly below average compared to that which is definitely within the low mentally retarded range for his Mexican-American counterpart. The results in Table 12 show quite clearly the linguistic handicap of the Mexican-American child prior to his formal education in the public school.

In Table 13, the Draw-A-Person mean scores show no significant differences between the ethnic groups. The present findings are in contrast to those found for the Peabody.

The Anglo-American pretest IQ of 92 is almost identical to that obtained on the Peabody (IQ 91), but the Mexican-American IQ of 92 is very significantly higher than that of below IQ 55 earned on the Peabody. It is apparent that the Draw-A-Person presents the Mexican-American preschool child in a more favorable status IQ-wise than on the heavily weighted Peabody test. The Mexican-American preschool on the average has risen from the mentally retarded status to that of a below average child.

Both ethnic groups made very significant gains between the pre and post test periods. The Anglo group gained 22 mean IQ points compared

2510

TABLE 12

ETHNIC GROUP DIFFERENCES ON THE
PRE AND POST PEABODY (PPVT)
TEST RESULTS

EVALUATION PERIOD	ANGLO-AMERICAN N=17		MEXICAN-AMERICAN N=62		MEAN DIFFERENCES
	MEAN	S.D.	MEAN	S.D.	
Pre-Test	49.53	14.64	30.89	16.57	18.64 *
Post-Test	52.29	12.87	36.06	16.14	16.23 *
Mean Differences	2.74		5.52		

* Significant at the one per cent level

2511

TABLE 13

ETHNIC GROUP DIFFERENCES ON THE
PRE AND POST DRAW-A-PERSON
TEST RESULTS

EVALUATION PERIOD	ANGLO-AMERICAN N=17 MEAN	S.D.	MEXICAN-AMERICAN N=62 MEAN	S.D.	MEAN DIFFERENCES
Pre-Test	6.71	4.10	7.21	3.62	.50
Post-Test	12.06	6.46	10.61	4.74	1.45
Mean Differences	5.35 *		3.40 *		

* Significant at one per cent level

2512

to that of 17 mean IQ points for his ethnic counterpart. The gain in mean differences between the ethnic groups are not significant beyond the five per cent level. Findings conclude, on the basis of Table 13, that the Draw-A-Person test appears to be a more culture "fair" test than the Peabody (PPVT).

The Gesell Index data shown in ,Table 14 reveal no significant mean differences, whether pre or post or between ethnic groups, in perceptual-motor maturational status.

Both these ethnic groups show about one year's retardation in perceptual-motor development when their mean chronological age is used as the criterion for comparative purposes.

Both ethnic groups gained about four to five months growth for the six week instructional period. However, their maturational status is still behind their normal peer group by about half a year.

From Table 15, the Anglo-American preschoolers as a group scored significantly fewer errors as on the Mateer Inversion tests than their ethnic counterpart. This means that the Anglo child is better prepared than the Mexican-American preschool child for formal reading readiness skills.

Although both groups made gains, the mean differences between the pre and post testing scores show no significant differences beyond the five

2513

TABLE 14

ETHNIC GROUP DIFFERENCES ON THE
PRE AND POST GESELL MATURATION
TEST RESULTS

EVALUATION PERIOD	ANGLO-AMERICAN N=17 MEAN	S.D.	MEXICAN-AMERICAN N=62 MEAN	S.D.	MEAN DIFFERENCES
Pre-Test	4.41	1.50	4.05	1.11	0.36
Post-Test	4.59	2.06	4.26	1.98	0.33
Mean Differences	0.18		0.21		

2514

TABLE 15

ETHNIC GROUP DIFFERENCES ON THE
PRE AND POST MATEER INVERSION
TEST RESULTS

EVALUATION PERIOD	ANGLO-AMERICAN N=17		MEXICAN-AMERICAN N=62		MEAN DIFFERENCES
	MEAN	S.D.	MEAN	S.D.	
Pre-Test	1.24	0.44	1.02	0.13	0.22 *
Post-Test	1.18	0.39	1.08	0.27	0.10 *
Mean Differences	0.06		0.06		

* Significant at the one per cent level

2515

per cent level. The lead that the Anglo groups possessed during the pretesting period was not overcome by the Mexican-American group at the post evaluation period. Minimal gains were made by both ethnic groups.

The Wide Range Achievement test results reported in Table 16 and 17 show similar findings as those obtained on the Metteer. On both the reading and arithmetic tests, the Anglo group scored significantly higher mean scores for both the pre and post testing periods than the Mexican-American group.

The Anglo group score at the 0.5 grade placement level in reading both for the pre and post tests. They earned a 0.9 grade placement score on the pre arithmetic test and a 1.0 placement score on the post.

The Mexican-American group earned a below 0.1 grade placement score both on the pre and post reading tests. In arithmetic, they were 0.4 and 0.6 for both testing periods.

Although both ethnic groups made positive gains during the two evaluation periods, the amount of gains are not significantly different between groups or within the groups. Table 17 results show that the Anglo group are again better prepared academically, at least for reading and arithmetic, than their Mexican-American counterparts.

Teacher Rating Scale Results. Tables 18, 19, 20 and 21 reveal very clearly the very significant changes for both ethnic groups in over all

2516

TABLE 16

ETHNIC GROUP DIFFERENCES ON THE PRE AND POST WIDE RANGE READING TEST RESULTS

EVALUATION PERIOD	ANGLO-AMERICAN N=17		MEXICAN-AMERICAN N=62		MEAN DIFFERENCES
	MEAN	S.D.	MEAN	S.D.	
Pre-Test	2.47	0.30	0.48	0.16	1.99 *
Post-Test	2.29	0.28	0.76	0.18	1.53 *
Mean Differences	0.18		0.28		

* Significant at the one per cent level

2517

TABLE 17

ETHNIC GROUP DIFFERENCES ON THE PRE AND POST WIDE RANGE ARITHMETIC TEST RESULTS

EVALUATION PERIOD	ANGLO-AMERICAN N=17		MEXICAN-AMERICAN N=62		MEAN DIFFERENCES
	MEAN	S.D.	MEAN	S.D.	
Pre-Test	6.65	0.53	3.71	0.45	2.94 *
Post-Test	7.76	0.44	5.32	0.46	2.44 *
Mean Differences	1.11		1.61		

* Significant at the one per cent level

TABLE 18

ETHNIC GROUP DIFFERENCES ON THE PRE AND POST RATINGS FOR THE TOTAL RATING SCALE

EVALUATION PERIOD	ANGLO-AMERICAN N=17		MEXICAN-AMERICAN N=62		MEAN DIFFERENCES
	MEAN	S.D.	MEAN	S.D.	
Pre-Test	29.06	6.49	24.06	5.88	5.00 *
Post-Test	35.82	7.09	31.50	5.66	4.32 *
Mean Differences	6.76 *		7.44 *		

* Significant at the one per cent level

519

TABLE 19

ETHNIC GROUP DIFFERENCES ON THE PRE AND POST RATINGS FOR THE TOTAL PERCEPTUAL-MOTOR DEVELOPMENT SCORE ON THE RATING SCALE

EVALUATION PERIOD	ANGLO-AMERICAN N=17 MEAN	S.D.	MEXICAN-AMERICAN N=62 MEAN	S.D.	MEAN DIFFERENCES
Pre-Test	8.94	1.85	7.52	2.08	1.42 *
Post-Test	10.71	2.31	9.11	1.89	1.60 *
Mean Differences	1.77 *		1.59 *		

* Significant at the one per cent level

2520

TABLE 20

ETHNIC GROUP DIFFERENCES ON THE PRE AND POST RATINGS FOR THE TOTAL INTELLECTUAL-ACADEMIC DEVELOPMENT SCORE ON THE RATING SCALE

EVALUATION PERIOD	ANGLO-AMERICAN N=17 MEAN	S.D.	MEXICAN-AMERICAN N=62 MEAN	S.D.	MEAN DIFFERENCES
Pre-Test	8.24	2.56	6.06	2.19	2.18 *
Post-Test	10.82	2.40	8.98	2.05	1.84 *
Mean Differences	2.58 *		2.92 *		

* Significant at the one per cent level

2521

TABLE 21

ETHNIC GROUP DIFFERENCES ON THE PRE AND POST RATINGS FOR THE TOTAL SOCIAL-EMOTIONAL DEVELOPMENT SCORE ON THE RATING SCALE

EVALUATION PERIOD	ANGLO-AMERICAN N=17		MEXICAN-AMERICAN N=62		MEAN DIFFERENCES
	MEAN	S.D.	MEAN	S.D.	
Pre-Test	11.88	2.62	10.45	2.41	1.43 **
Post-Test	14.29	2.80	13.40	2.40	0.89 **
Mean Differences	2.41 *		2.95 *		

* Significant at the one per cent level

* * Significant at the five per cent level

2522

ratings for all three developmental areas measured by the rating scale. In all four instances, the Anglo-American group, on the average, are given significantly higher total and sub-total ratings beyond the one per cent level than their ethnic counterparts.

Over-all total ratings for the pre and post test periods as shown in Tables 18, 19, 20 and 21 likewise revealed the fact that significant mean gains had occurred for both ethnic groups.

The results indicate that on the over-all total ratings, the teachers rated the Anglo group superior in perceptual-motor, social-emotional and intellectual-academic development than their ethnic counterpart.

Most of the objective test results, except for the Draw-A-Person and Gesell Index, bear out the teachers over-all ratings.

However, it should be noted that the size of mean differences between the two ethnic groups decrease positively by the post testing periods. In short, the lessening of the gap between the pre and post periods are clearly observed by the teachers as revealed by their ratings for both ethnic groups.

Analysis of Tables 22, 23 and 24, show conclusively the fact that the Mexican-American, as a group, made significantly greater post test mean gains than the Anglo-American group on three out of the four social-emotional attributes measured on the rating scale. On the fourth socio-emotional trait, child's interest in program, the Anglo-American group also made significant post test mean gains similar to those for the

2523

Mexican-American group.

Differences between ethnic groups revealed no significant mean scores on the four social-emotional traits either at the pre or post periods. Similar social-emotional development as reported on the above findings were substantiated by the Draw-A-Person test results reported earlier.

Tables 26, 28, 30 and 31, results show that the significantly higher pre-test mean gains for the Anglo-American group did not appear on the post test. Interesting enough, on two perceptual-motor skills the Mexican-American showed significant post test mean gains whereas the Anglo-American group did not. On the other tro traits, both ethnic groups improved significantly.

In short, two of these traits fell in the perceptual-motor areas and the other two were in the intellectual-academic areas.

Only on two skills did the Anglo-American group receive consistently higher significant mean ratings than the Mexican-American group. These are seen in Tables 27 and 29. One skill was involved with vocabulary development, the other was concerned with knowledge of one's body image and differentiation of body parts.

2524

TABLE 22

ETHNIC GROUP DIFFERENCES ON THE PRE AND POST RATINGS OF ITEM 1 OF THE RATING SCALE: "ATTITUDE TOWARD SCHOOL"

EVALUATION PERIOD	ANGLO-AMERICAN N=17		MEXICAN-AMERICAN N=62		MEAN DIFFERENCES
	MEAN	S.D.	MEAN	S.D.	
Pre-Test	3.24	0.83	2.81	0.70	0.43
Post-Test	3.59	1.12	3.53	0.72	0.06
Mean Differences	0.35		0.72 *		

* Significant at the one per cent level

2525

TABLE 23

ETHNIC GROUP DIFFERENCES ON THE PRE AND POST RATINGS OF ITEM 2 OF THE RATING SCALE "ADJUSTMENT TO GROUP SITUATION"

EVALUATION PERIOD	ANGLO-AMERICAN N=17 MEAN	S.D.	MEXICAN-AMERICAN N=62 MEAN	S.D.	MEAN DIFFERENCES
Pre-Test	3.00	0.61	2.50	0.78	0.50
Post-Test	3.24	1.20	3.29	0.75	0.05
Mean Differences	0.24		0.79 *		

* Significant at the one per cent level

2526

TABLE 24

ETHNIC GROUP DIFFERENCES ON THE PRE AND POST RATINGS OF ITEM 3 OF THE RATING SCALE "INDEPENDENCE FROM MOTHER"

EVALUATION PERIOD	ANGLO-AMERICAN N-17 MEAN	S.D.	MEXICAN-AMERICAN N=62 MEAN	S.D.	MEAN DIFFERENCES
Pre-Test	3.06	0.83	2.69	0.67	0.37
Post-Test	3.42	1.23	3.40	0.64	0.02
Mean Differences	0.36		0.71 *		

* Significant at the one per cent level

2527

TABLE 25

ETHNIC GROUP DIFFERENCES ON THE PRE AND POST RATINGS OF ITEM 4 OF THE RATING SCALE "CHILD's INTEREST IN PROGRAM"

EVALUATION PERIOD	ANGLO-AMERICAN N=17		MEXICAN-AMERICAN N=62		MEAN DIFFERENCES
	MEAN	S.D.	MEAN	S.D.	
Pre-Test	2.71	0.85	2.52	0.80	0.19
Post-Test	3.35	1.17	3.26	0.81	0.09
Mean Differences	0.64 *		0.74 *		

* Significant at the one per cent level

2528

TABLE 26

ETHNIC GROUP DIFFERENCES ON THE PRE AND POST RATINGS OF ITEM 5 OF THE RATING SCALE "CONTRIBUTIONS TO CLASS ACTIVITIES"

EVALUATION PERIOD	ANGLO-AMERICAN N=17		MEXICAN-AMERICAN N=62		MEAN DIFFERENCES
	MEAN	S.D.	MEAN	S.D.	
Pre-Test	2.77	0.83	2.15	0.79	0.62 *
Post-Test	3.59	1.37	3.13	0.95	0.46
Mean Differences	0.82 *		0.98 *		

* Significant at the one per cent level

2529

TABLE 27

ETHNIC GROUP DIFFERENCES ON THE PRE AND POST RATINGS OF ITEM 6 OF THE RATING SCALE "VOCABULARY DEVELOPMENT"

EVALUATION PERIOD	ANGLO-AMERICAN N=17		MEXICAN-AMERICAN N=62		MEAN DIFFERENCES
	MEAN	S.D.	MEAN	S.D.	
Pre-Test	2.77	1.03	1.92	0.80	0.85 *
Post-Test	3.53	1.37	2.90	0.72	0.63 *
Mean Difference	0.76 *		0.98 *		

* Significant at the one per cent level

2530

TABLE 28

ETHNIC GROUP DIFFERENCES ON THE PRE AND POST RATINGS OF ITEM 7 OF THE RATING SCALE "INTEREST DEVELOPMENT IN LANGUAGE"

EVALUATION PERIOD	ANGLO-AMERICAN N=17		MEXICAN-AMERICAN N=62		MEAN DIFFERENCES
	MEAN	S.D.	MEAN	S.D.	
Pre-Test	2.71	0.92	2.00	0.86	0.71 *
Post-Test	3.35	1.32	2.95	0.69	0.40
Mean Differences	0.64 *		0.95 *		

* Significant at the one per cent level

2531

TABLE 29

ETHNIC GROUP DIFFERENCES ON THE PRE AND POST RATINGS OF ITEM 8 OF THE RATING SCALE "BODY IMAGE AND BODY DIFFERENTIATION"

EVALUATION PERIOD	ANGLO-AMERICAN N=17		MEXICAN-AMERICAN N=62		MEAN DIFFERENCES
	MEAN	S.D.	MEAN	S.D.	
Pre-Test	3.00	0.61	2.45	0.82	0.55 *
Post-Test	3.53	1.33	2.97	0.72	0.56 *
Mean Differences	0.53 *		0.52 *		

* Significant at the one per cent level

2532

TABLE 30

ETHNIC GROUP DIFFERENCES ON THE PRE AND POST RATINGS OF ITEM 9 OF THE RATING SCALE "LATERALITY AND DIRECTIONALITY ABILITY"

EVALUATION PERIOD	ANGLO-AMERICAN N=17 MEAN	S.D.	MEXICAN-AMERICAN N=62 MEAN	S.D.	MEAN DIFFERENCES
Pre-Test	3.00	0.71	2.46	0.78	0.54 *
Post-Test	3.47	1.28	3.02	0.74	0.45
Mean Differences	0.47		0.56 *		

* Significant at the one per cent level

2533

TABLE 31

ETHNIC GROUP DIFFERENCES ON THE PRE AND POST RATINGS OF ITEM 10 OF THE RATING SCALE "SENSORY DISCRIMINATION ABILITY"

EVALUATION PERIOD	ANGLO-AMERICAN N=17		MEXICAN AMERICAN N=62		MEAN DIFFERENCES
	MEAN	S.D.	MEAN	S.D.	
Pre-Test	3.00	0.71	2.60	0.64	0.40 **
Post-Test	3.35	1.27	3.13	0.56	0.22
Mean Differences	0.35		0.53 *		

* Significant at the one per cent level

* * Significant at the five per cent level

2534

CHAPTER III

SUMMARY AND CONCLUSIONS

The primary purposes of the study were twofold: (1) to determine whether or not significant differences in performance exist between the pre and post test results of seventy-nine preschool culturally disadvantaged Head Start children; and (2) to determine if these significant differences exist between the Anglo-American (N=17) and Mexican-American (N=62) pupils in the preschool program.

The sample population was obtained from over one hundred participating preschool children who were enrolled in the Clavis Montessori six week summer Head Start program. It was hypothesized that the six week exposure to the Montessori experiences could provide these culturally disadvantaged with the significant impetus which would assist them in obtaining more satisfying experiences in the fall semester's kindergarten class.

Three developmental areas were investigated in the study: social-emotional, intellectual-academic and perceptual-motor. Seven devices were employed to evaluate the various skills in each of the three developmental areas. The instruments were: Peabody (PPVT), Goodenough-Harris Draw-A-Person, Gesell Maturation Index, Mateer Inversion test, Wide Range Achievement test, Dominance tests and the Teacher Rating Scale.

2535

Each of the tests were given during the first and last (sixth) week of schooling. Only those pupils who took the same battery of the tests twice were included in the study.

The obtained data were treated by the BIMD 05V and 03R programs on the 7040 and 7090 machines at the University of California Los Angeles Health Sciences Computing Facility. Means, standard deviations, analysis of variance and F ratios were derived for the study. Bartlett's test was used to test the homogeneity of variance within each cell for the BIMD 05V data.

2536

A. SUMMARY

Miscellaneous findings

1. Income level. The median income of the population sampled fell within $3,000 to $3,999 range. Since the median income for Orange County is within the $7,000 to $7,999 bracket, the income status of the families in the Montessori Head Start summer program can be classified as "poor". Further credence is added to the poverty classification when each Head Start household was found to contain 5.5 members compared to that of 3.4 for the Orange County as a whole. The Mexican-American families, as a group, reported significantly lower annual income than their Anglo-American counterparts ($3,000 to $5,000).

2. Chronological age. The mean age was 5 years and 2 months. The ages of the boys and girls were almost identical. The obtained age is slightly below average for children entering kindergarten in September. There were no significant mean age differences between the two ethnic groups.

3. Physical status. The mean weight of 42 lbs. is considered normal for the mean age of 5 years and 2 months. The mean height of 40 in. is somewhat undersized for the obtained mean age. Thus, in comparison with CAP-HS Form 30 Health Record standards, a typically short but slightly overweighted preschooler is depicted by the above findings.

No significant mean height or weight differences were found between the two ethnic groups.

4. Health Status. One out of every three preschooler evidenced medical problems ranging from cardio-vascular to genitialia defects. Over 40 per cent of the children had unfilled carious teeth or malocclusion problems. The need for medical and especially dental attention is dramatically demonstrated by the above findings. Mexican-American preschool children had significantly more medical and dental defects than their ethnic counterpart.

5. Intellectual-academic Development.

A. Regardless of ethnic group membership, the pre-test results indicated that the average culturally disadvantaged child was functioning at the borderline mentally retarded level (IQ=72) when intelligence is measured by the Peabody test, a test which is highly verbal in nature. When a culture "fair" test such as the Draw-A-Person is used, the mean IQ rises to 92. Post testing results showed an increase in the Peabody IQ to 79 and in the Draw-A-Person to IQ 111. In short, remarkable changes in IQ points from 7 to 19 were obtained. Increase in mental age scores ranged from 4 to 12 months for the six weeks of Head Start program.

B. Significant gains in oral arithmetic readiness skills were obtained in contrast to those for the reading readiness findings which revealed some positive gains, but which were statistically insignificant. Both the mean reading and arithmetic scores for the pre and post tests were about half a year behind their normal non-culturally disadvantaged peers.

2538

C. Ethnic group comparisons showed the pre-test Anglo-American mean IQ to be 91 compared to that of below the mean IQ of 55 for the Mexican-American pupils on the Peabody test. Post test results did not show significant increases in the mean IQ scores within each ethnic group. The findings evidenced the linguistic handicap of the preschool Mexican-American child.

The use of the Draw-A-Person raised the Mexican-American mean IQ from the mentally retarded level, found on the Peabody test, to the below average range. In fact, the pretest Mexican-American mean IQ of 91, on the Draw-A-Person, was almost identical to the mean IQ of 92 for the Anglo-American child. Both ethnic groups gained from 17 to 22 IQ points on the post tests.

D. On the reading and arithmetic readiness tests, the Anglo-American pupils received significantly higher mean scores than their ethnic counterpart. Both ethnic groups made positive, but not significant mean gains between the pre and post testing periods. The Anglo-American group scored at grade level in contract to the Mexican-American pupils whose mean scores were at the pre-readiness stage.

E. On the Teacher Rating Scale, all the mean ratings showed significant increases between the pre and post tests. In the intellectual-academic area, the teacher's ratings agreed very well with the objective test results. Rank order analysis employed to cross-validate the objective test findings substantiated the phenomenal growth which occurred

2539

during the sixth week period. On the average, the Mexican-American as a group, made many more significant gains according to the teacher's ratings between the pre and post periods than the Anglo-American pupils.

6. Perceptual-motor Development

A. Both ethnic groups showed about a year's retardation in perceptual-motor development in the pre-test period. Post test results showed an increase of about half a year.

B. Teacher's pre and post ratings also indicated definite weaknesses in visual motor performances. The Mexican-American group showed significantly greater mean gains than the Anglo-American pupils in sensory, laterality and directionality training.

C. Rank order analysis of the teacher's ratings placed the perceptual motor skills at the bottom of the list in terms of amount of improvement perceived by the teachers themselves. As was reported earlier, the objective test results for the post period likewise showed positive, but statistically non-significant results for the perceptual-motor as contrasted to the highly significant mean gains obtained for the intellectual-academic developmental area.

D. One out of every two pupils was reported as ambidexterous. Since unilateral development is usually established by the age of two, significant eye-hand confusion problems were found to exist among fifty per cent of the pupils tested (regardless of ethnic grouping).

2540

7. Social-emotional development

A. Teacher's ratings revealed very significant gains in the pupil's social and emotional adjustments to school between the pre and post testing periods.

B. The Mexican-American pupils as a group showed more significant mean gains than their counterpart in their attitudes toward school, adjustment in group situations and interest in the school program.

C. An analysis of the Draw-A-Person findings substantiated in part the significant development as reported by the teachers. As noted earlier, very significant gains in mental age units were obtained, regardless of ethnic group membership, between the pre and post evaluation periods.

041

B. CONCLUSIONS

The major hypothesis based on the null concept that no significant differences exist between the pre and post test results was rejected by the findings of this study.

The results showed conclusively that certain handicaps do, in fact, exist with preschool culturally disadvantaged children prior to their enrollment in the fall semester's kindergarten classes.

The results also revealed rather significantly, the positive gains that can occur when culturally disadvantaged children are provided with enriching educational experiences for a relatively short period of six weeks.

The findings suggest that the drop out rate of six per cent obtained between the first and last week of testing is certainly indicative of the successful holding power of the Montessori preschool program as well as the degree of parental interest in preschool educational programs for their children.

The most significant increases are found in the intellectual-academic and social-emotional skill areas rather than in the perceptual-motor maturational skills. Future preschool programs might well provide more experiences to compensate for the children's inadequacies in the perceptual-motor areas.

As expected, the population sampled showed apparent limitations in linguistic skills. Especially the children of Mexican-American descent

2542

who demonstrated greater susceptivity than the Anglo-American children to such language handicaps.

The findings also illustrated the urgent need for more effective communications between the local health and welfare agencies and the low income families in the communities involved in this study. The fact that so many preschool culturally disadvantaged children were found in need of medical and dental treatment clearly points to the lack of parental awareness of local facilities wherein assistance may be obtained. Since the majority of the families in the Head Start program were not on County Welfare rolls, the need for wider dissemination of health services are self-evident.

A summation of present findings indicated rather succinctly and clearly the undisputable existence of physical, social and intellectual handicaps that a significant number of culturally disadvantaged pre-school children are currently experiencing. The significant gains shown in the post test results further substantiate the immense value of pre-school educational programs to the extent that the findings dramatically point to the necessity for the continuance of preschool experiences in the future for all culturally disadvantaged children, regardless of ethnic background.

543

APPENDIX A

REFERENCES
(BIBLIOGRAPHY)

2544

REFERENCES

Cook, J. C. and Arthur, G., "Intelligence Ratings for 97 Mexican children in St. Paul, Minnesota,""High School Journal 1955, 38, 24-33.

Gray, S.W., The Performance of the Culturally Deprived Child: Contributing Variables. The Seventh Annual Professional Institute of the Division of School Psychologist and American Psychological Association, 1962, 27-29, 7-13.

Guilford, J.P. Fundamental Statistics in Psychology and Education, Third Edition, McGraw-Hill Company, 1956.

Jensen, A.R., "Learning Abilities in Mexican-American and Anglo-American children," California Journal of Educational Research, 1961, 12, 147-149

Johnson, Henry S. "A Cross-cultural Study of Motivation and Achievement," American Psychologist, 1964, 19, 471.

Keston, M. J. and Jimenez, C. A. "A Study of the Performance on English and Spanish Editions of the Stanford-Binet Intelligence Test by Spanish-American Children, Journal of Genetic Psychology, 1954, 85, 263-269.

Kidd, A. H. "The Culture-Fair Aspects of Cattell's Test of 'g': Culture-Free", Journal of Genetic Psychology, 1962, 101, 343-364.

Naumann, T. F., "A Creative Learning Environment for Normal and Handicapped Pupils" American Montessori Society Bulletin, 1965, 3, No.2.

Orpet, Russel E. "Four Hypothesized Factor-Abilities at Three Age Levels in Normals and Retardates," Monographs of the Society for Research in Child Development, 1964, In press.

Skeels, Harold M., "Effects of Adoption on Children from Institutions." Children, 1965, 12, 33-34.

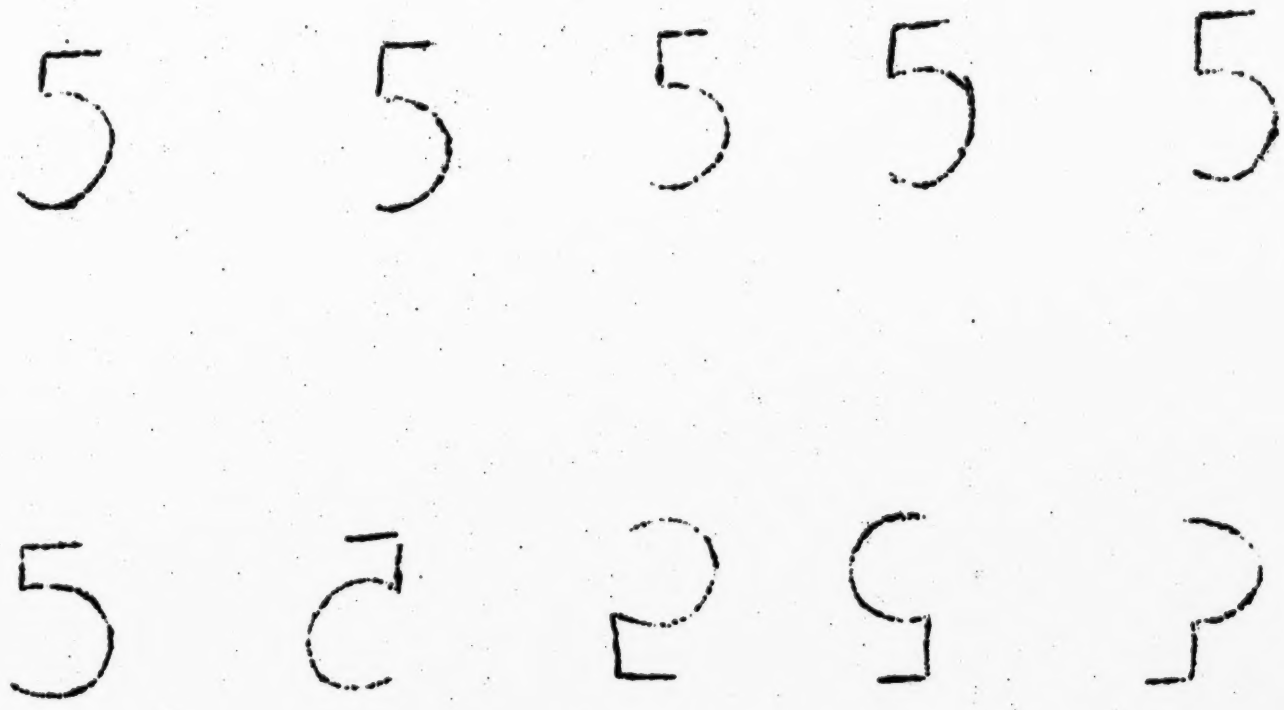
2545

APPENDIX B

(SAMPLE TESTS)

2546

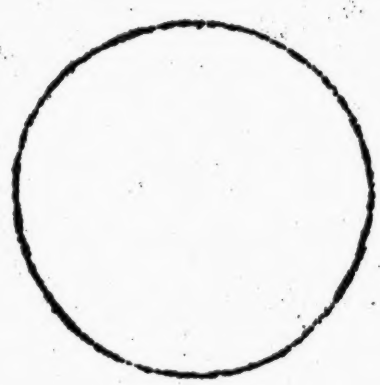
MATEER INVERSION TEST



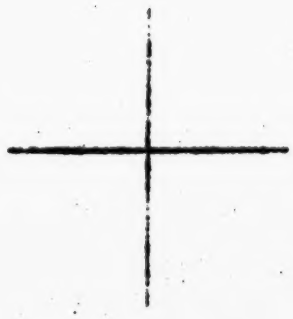
DOCUMENT FILMED FROM BEST AVAILABLE COPY.

254

3

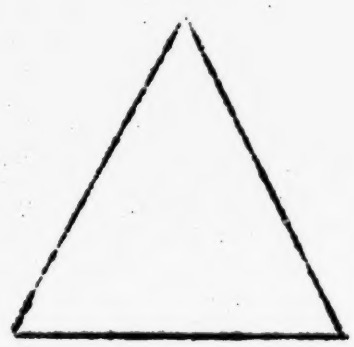


4

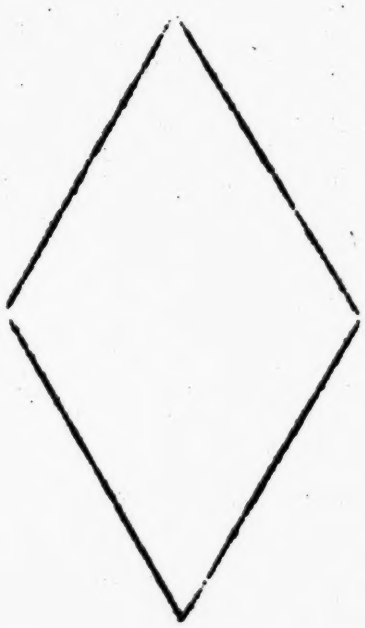


5

6



7



DOCUMENT FILMED FROM BEST AVAILABLE COPY.

254

CLAVIS MONTESSORI SCHOOLS
OPERATION HEAD START PRESCHOOL RECORD

(TEACHER RATING SCALE)

Child's Name _____ Sex _____

SOCIAL AND EMOTIONAL ADJUSTMENT

		First Week	Last Week
1	attitude toward school (display of like or dislike)	1 2 3 4 5	1 2 3 4 5
2	adjustment to group situations (sensitivity to & expression of humor)	1 2 3 4 5	1 2 3 4 5
3	independence from mother (skills in self-help)	1 2 3 4 5	1 2 3 4 5
4	child's interest in program (problem solving attitude in terms of perseverance)	1 2 3 4 5	1 2 3 4 5

LANGUAGE DEVELOPMENT

5	contribution to class activities (group participation & sharing skills)	1 2 3 4 5	1 2 3 4 5
6	vocabulary development (working and understanding skills, receptive skills & expressive skills)	1 2 3 4 5	1 2 3 4 5
7	interest development in language activities (problem-solving skills)	1 2 3 4 5	1 2 3 4 5

PERCEPTUAL-MOTOR DEVELOPMENT

8	body image and differentiation of body parts	1 2 3 4 5	1 2 3 4 5
9	laterality & directionality eye-hand coordination	1 2 3 4 5	1 2 3 4 5
10	sensory discrimination, tactile, auditory, visual, kinesthetic	1 2 3 4 5	1 2 3 4 5

Key: Check accordingly

#1 very poor, unsatisfactory, limited

#3 satisfactory, normal, average

#5 excellent, outstanding, potential unlimited

Additional comments: (attendance, muscle coordination, physical appearance, etc.)